

Section 8.3 - Finding x and y intercepts

To find the x-intercept, make the y value 0. (numerator = 0) $(x, y) \quad (-, 0)$

To find the y-intercept, make the x value 0. $(x, y) \quad (0, -)$

examples: $\frac{3(0)-15}{0+5} = \frac{-15}{5} = -3$ $\left\{ \frac{2(0)+18}{(0-2)(0+3)} = \frac{18}{-6} = -3 \right\}$ $\frac{9}{12}$

$$1) y = \frac{3x-15}{x+5}$$

$$0 = \frac{3x-15}{x+5} \cdot (x+5)$$

$$0 = 3x - 15$$

$$\frac{15}{3} = \frac{3x}{3} \quad x = 5$$

x-int: $(5, 0)$

y-int: $(0, -3)$

$$2) y = \frac{2x+18}{(x-2)(x+3)}$$

$$0 = 2x + 18$$

$$-18 = 2x$$

$$-9 = x$$

x-int: $(-9, 0)$

y-int: $(0, -3)$

$$3) y = \frac{2x^2+9x+9}{x^2-7x+12} \quad 18$$

$$0 = 2x^2 + 9x + 9$$

$$(2x^2 + 6x + 3x + 9)$$

$$2x(x+3) + 3(x+3)$$

$$(2x+3)(x+3)$$

x-int: $(-\frac{3}{2}, 0) \quad (-3, 0)$

y-int: $(0, \frac{3}{4})$

Putting it all together:

Find the x-intercept, y-intercept, vertical and horizontal Asymptotes for each function:

4) $\frac{x+4}{(x-2)(x-4)}$ *bottom*

$x+4=0$
 $x=-4$ $\frac{0+4}{(0-2)(0-4)} = \frac{4}{8}$

$x-2=0$ $x-4=0$
 $x=2$ $x=4$

num=0 $(-4, 0)$
 x-int: $(-4, 0)$

$x=0$
 y-int: $(0, 1/2)$

den=0 $x=2, 4$
 VA: $x=2, 4$

HA: $y=0$

degree rules

5) $\frac{2}{x-1}$ *bottom*

$2=0$ False

$\frac{2}{0-1} = \frac{2}{-1} = -2$

$x-1=0$

none

x-int: $(0, -2)$

y-int: $(0, -2)$

VA: $x=1$

HA: $y=0$

6) $\frac{x^2-9}{3x-12}$ *top* $\frac{-9}{-12} = \frac{3}{4}$

$x^2-9=0$
 $(x-3)(x+3)=0$

$3x-12=0$

$3x=12$

$x=4$

x-int: $(-3, 0)(3, 0)$

y-int: $(0, 3/4)$

VA: $x=4$

HA: *none*

Homework: 4/15
p. 7 - ALL